

USSN 09/457,434
Atty. Docket No. HEN-9910

IN THE SPECIFICATION

Please replace the paragraph beginning at page 8, line 6, with the following amended paragraph:

D1

— A combined liquid phase and vapor phase product stream exit reaction vessel R1 via line 16 and into separation zone S wherein a liquid phase product stream is separated from a vapor phase product stream. The liquid phase product stream will typically be one that has components boiling in the range from about 150°C to about 650°C, but will not have a boiling range greater than the feedstream. The vapor phase product stream is collected overhead via line 18. —

Please replace the paragraph beginning at page 8, line 23, bridging to page 9, with the following amended paragraph:

D2

— Fresh hydrogen-containing treat gas is introduced into reaction stage R2 via line 24 and is passed in an upward direction counter to the flow of liquid reaction product. The introduction of clean treat gas (gas substantially free of H₂S and NH₃) allows reaction stage R2 to be operated more efficiently owing to a reduction in the activity suppression effects on the catalyst exerted by H₂S and NH₃ and an increase in H₂ partial pressure. This type of two stage operation is particularly attractive for very deep removal of sulfur and nitrogen or when a more sensitive catalyst (i.e., hydrocracking, aromatic saturation, etc.) is used in the second reactor. Another advantage of the present invention is that the treat gas rate is relatively low compared with more conventional processes. The use of relatively low treat gas rates is primarily due to the use of previously hydrotreated distillate feedstocks. Further efficiencies are gained by not requiring recycle of treat gas. —

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Please replace the paragraph beginning at page 9, line 10, with the following amended paragraph:

DS

- The liquid/vapor separation step (S) may be a simple flash or may involve the addition of stripping steam or gas to improve the removal of H₂S and NH₃. The liquid stream and treat gas are passed countercurrent to each other through one or more catalyst beds, or reaction zones, 22a and 22b. The resulting liquid product stream exits reaction stage R2 via line 26, and a hydrogen-containing vapor product stream exits reaction stage R2 and is cascaded to reaction stage R1. Reaction stage R2 also contains non reaction zones 23a and 23b following each reaction zones. The catalyst in this second reaction stage is an aromatic saturation catalyst. -

Please replace the paragraph beginning at page 9, line 19, with the following amended paragraph:

DM

- The figure also shows several options. For example, lines 30 and 32 can carry kerosene which can be used as a quench fluid. Also, a unsaturated feedstock can also be introduced into the first reaction stage via line 28. The degree of unsaturation can be up to about 50 wt %. -

IN THE FIGURES

Please enter the amended Figure; a replacement page and marked-up version showing the changes made are attached hereto.